Morgan Monroe State Forest (USMMS)

Tyler Roman
Benjamin Sulman

Indiana University

/www.indiana.edu/~co2/home/

Site description

Location: South-Central Indiana, 15 miles from Bloomington

Climate:

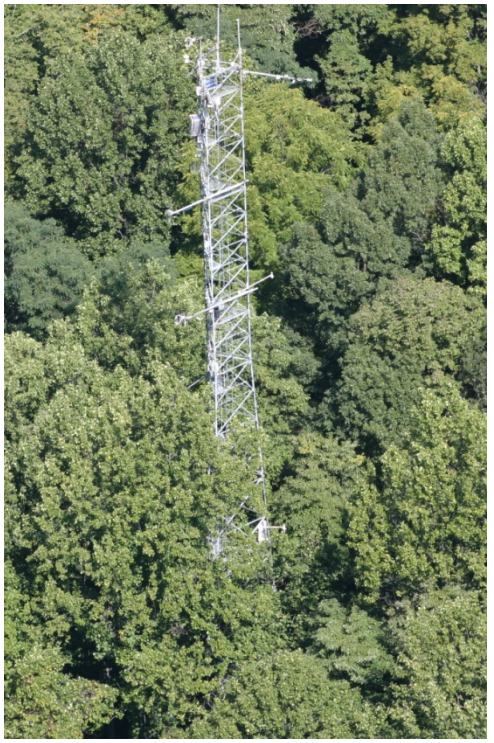
- Mean precipitation: 1013 mm
- Mean temperature: 11.2 C

Elevation: 275 m above sea level

Topography: Ridge/ravine with relief < 60 m. Drops 90 m in 4 km

Ecosystem characteristics:

- Mixed hardwood (dominant species: tulip poplar, white oak, red oak, sassafras, and sugar maple)
- Secondary growth (stand age 60-90 years)
- Canopy height: 27 m



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nstrumentation

r instrumentation:

Free-standing tower, height: 46 m

Closed-path gas analyzers (Li-7000) with intakes at 46, 34 and 2m

CSAT-3 at 46, 34 and 2m

PAR sensors: 46, 22, and 1.8 m

4 component radiation (CNR1) at 46, 34 and 2m

Total incoming shortwave radiation (28, 14, and 2 m)

Cloud height (ceiliometer)

Phenocam site

COSMOS soil moisture site

- Below Canopy (BC) sites:
  - Air T/RH
  - Wind cup and vane
  - Soil T, heat flux and moisture
  - PAR, Kdown and Q*
- Biological measurements:
  - Dendrometer bands
  - Sap flow
  - Leaf photosynthesis, water potential
  - Soil CO_2 efflux (automatic and manual chambers), temperature, and moisture
  - Litterfall, leaf C and N content

Team

Kim Novick (Flux measurement PI)

Rich Phillips (Soil measurements and experiments, Co-PI)

Edward Brzostek (Biometric and belowground)

Ben Sulman (Flux data processing and analysis)

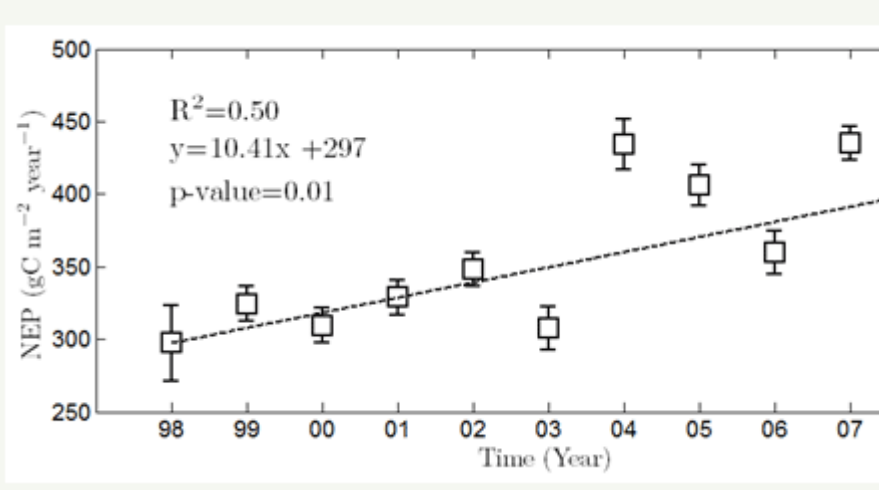
Tyler Roman (Technical maintenance and data collection)

Steve Scott (Field and instrumentation scientist)

Danilo Dragoni ran site until 2012

Research highlights

Continuous flux measurements since 1998: Observed long-term trend in NEP (Dragoni et al 2010)



Water fluxes and drought response

- Scaling leaf and soil water potential to canopy gas exchange (2011-present)
- Sapflow (2011-present)
- Effects of 2011 and 2012 droughts

Below-ground C and N cycling

- Differences in soil carbon cycling and microbial activity associated with mycorrhizal associations (Phillips et al 2013)
- Extensive soil CO_2 efflux measurements and manipulations (girdling, root exclusion, N addition)

N fluxes and aerosol deposition

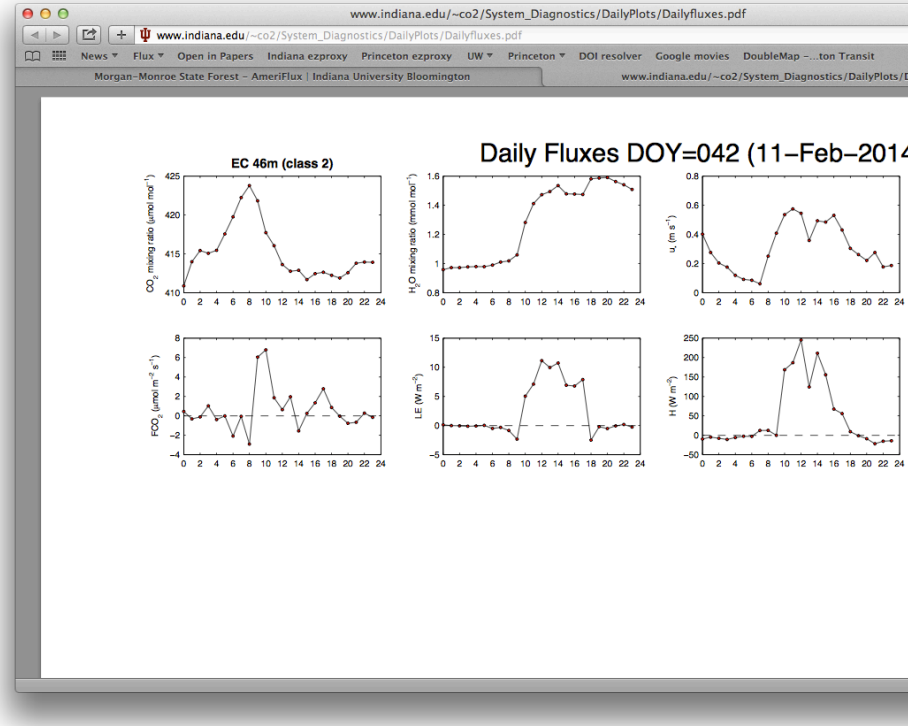
Data processing

ta management:

- Data from the flux instrumentation and other automated measurements are automatically transferred to a university-hosted server every day
- Data plots are automatically produced every day and linked to a web interface to allow easy checking for equipment problems
- Remote login capability at site computers

x calculation:

- Matlab code base
- Basic QA/QC (spikes, unreasonable values)
- Flux processing as often as necessary
- Gap-filling and partitioning annually



Short-term goals

- Continue to produce high-quality, reliable data (through PI transition)
- Establish new collaborations
- Expand sap flow measurements and continue to investigate species composition effects and scaling
- Potential site comparison with Coweeta Hydrologic Lab (similar species but much wetter climate)

What do we want from Ameriflux?

Easier format for BADM

- Excel is a difficult format for hierarchical data
- Challenging to read/write Excel format data from Matlab/Python/R etc
- Large number of fields that won't be filled is difficult for both submitters and users of data

Easy data submission interface

Facilitation of collaboration

Do QA/QC systems include LE?